

# Wake on LAN (WoL)

The  [Wake-on-LAN \(WoL\)](#) feature was implemented in Batocera **v33**. After enabling it, it is possible to turn on/off your Batocera machine by sending a “magic packet” (or something else, more info later) via a network cable. This could be used to turn on the machine by using a network protocol call, a network-connected IR remote receiver, a packet sent over a virtual network, and many other things!

## Requirements

On the Batocera machine, the functionality of WoL is dependent on two components supporting it:

- **BIOS:** The system's BIOS must support WoL (you may have to enable WoL within your system's [BIOS settings](#)).
- **NIC:** The system's network adapter must support WoL to stay “awake” while the system is powered off.

If you are dual-booting with Windows on the same machine, you may need to also [tell Windows to not disable the WoL shutdown procedure in its drivers](#).

After checking for the above, boot Batocera and [run](#) `ifconfig`. Identify the network interface name of your connection, and then run the appropriate `ethtool eth0` command, where `eth0` is the name of your network interface. It should give you an output similar to this:

Typical example output here.

| Property          | Notes                                                                                                |
|-------------------|------------------------------------------------------------------------------------------------------|
| Supports Wake-on: | Shows which hardware WoL capabilities the NIC supports (these values cannot be changed by the user)  |
| Wake-on:          | Shows which software WoL capabilities are currently enabled (these can be turned on/off by the user) |

The value `g` means that your NIC supports receiving magic packets and therefore *is* WoL capable. Note that your NIC could also support multiple WoL functions and therefore you would get multiple output values, e.g. `Supports Wake-on: pumbg`.

Here is a full list of output possibilities (more info at <https://linux.die.net/man/8/ethtool> or the `man ethtool` command):

- `p` ⇒ Wake on PHY activity
- `u` ⇒ Wake on unicast messages
- `m` ⇒ Wake on multicast messages
- `b` ⇒ Wake on broadcast messages
- `a` ⇒ Wake on ARP
- `g` ⇒ Wake on MagicPacket™
- `s` ⇒ Enable SecureOn™ password for MagicPacket™

- d ⇒ Disable (wake on nothing). This option clears all previous options.

The most important value is g. Without it being shown, the NIC does not support WoL at all.

## USB-LAN adapter example



USB-LAN adapters are typically capable of supporting WoL, but have the feature turned off by default. Running the above would output the following:

```
Supports Wake-on: g
Wake-on:
```

This means the machine's NIC is indeed WoL capable but not yet enabled. To enable the according option persistently a udev rule can be utilized. Read the [section below](#) on how to do that.

## Enabling WoL via udev

First, if it doesn't already exist create the folder(s) at `/userdata/system/udev/rules.d/`. Then, save the following file into the `rules.d/` folder:

### 99-wol.rules

```
ACTION!="add|change", GOTO="end"
SUBSYSTEM!="net", GOTO="end"
ENV{INTERFACE}!="eth*", GOTO="end"

TEST=="/sys/class/net/${env{INTERFACE}}/device/power/wakeup",
RUN+="/bin/sh -c 'echo enabled
>/sys/class/net/${env{INTERFACE}}/device/power/wakeup' "

ACTION=="add|change", SUBSYSTEM=="net", ENV{INTERFACE}=="eth*",
RUN+="/usr/sbin/ethtool -s ${env{INTERFACE}} wol g"

LABEL="end"
```

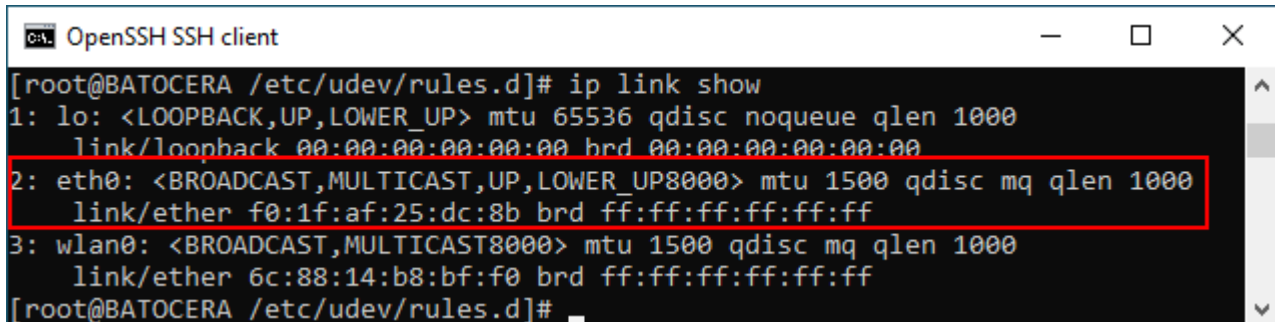
The code below will enable WoL for all of your system's WoL capable NICs. If for some reason you want to enable WoL only for a specific NIC (e.g. `eth0`), replace `eth*` with the according specific NIC name on the ACTION code line .

Reboot the machine.

## Wake up your Batocera device remotely

Note: It is important to have your WoL client and your Batocera system within the same [Layer 2](#) subnet of your network, otherwise WoL will not work as WoL packages cannot be routed over different subnets.

To find out the unique MAC address of your Batocera system's NIC, run `ip link show`.

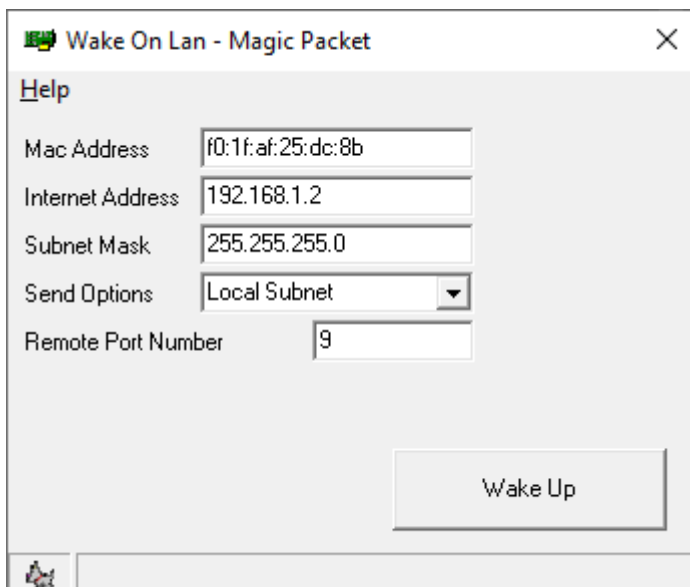


```
[root@BATOCERA /etc/udev/rules.d]# ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue qlen 1000
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP8000> mtu 1500 qdisc mq qlen 1000
   link/ether f0:1f:af:25:dc:8b brd ff:ff:ff:ff:ff:ff
3: wlan0: <BROADCAST,MULTICAST8000> mtu 1500 qdisc mq qlen 1000
   link/ether 6c:88:14:b8:bf:f0 brd ff:ff:ff:ff:ff:ff
[root@BATOCERA /etc/udev/rules.d]#
```

The MAC address for this NIC (eth0) is `f0:1f:af:25:dc:8b`.

You can now use the given MAC address to wake the Batocera machine up remotely from another device (e.g. PC, Smartphone, ...) which is **within the same Layer 2 subnet** and has a WoL client ([GUI based](#) or [command line based](#) WoL client) installed.

Example of a WoL client for Windows ([Depicus Wake on Lan for Windows GUI](#)):



Most utilities require the following information (or similar enough to it):

- **Mac Address** ⇒ MAC address of your NIC on the Batocera machine.
- **Internet Address** ⇒ The IP of the NIC on the Batocera machine (if only one NIC is present on the WoL client, you can leave this empty).
- **Subnet Mask** ⇒  [Netmask](#) of the network's subnet.

- **Send options** ⇒  (what is this for? Why would I want to change it?) Choose Local Subnet.
- **Remote Port Number** ⇒ The port to send the traffic on. Acceptable values are generally 9 (default) or 7.

Click on **Wake Up** to wake the Batocera machine up.

## Troubleshooting

### Machine will not wake up

Try changing the port number from 9 to 7. If the machine uses an esoteric port this will usually be noted in its documentation.

If that did not work, try sending the packet via Internet instead of Local Subnet.

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